REMARKS/ARGUMENTS

Claims 3-9, 19, and 27-32 are pending in this application. By this Amendment, Applicant AMENDS claims 3-6 and 19; CANCELS claims 1, 2, 10-18, and 20-26; and ADDS claims 27-32.

Support for new claims 27-32 can be found in, for example, Applicant's originally filed claims 5-9 and 19, respectively.

Applicant affirms the election of Group I, Species A, including claims 1-5, 15-19, and 26 without traverse. Applicant has canceled claims 10-14 and 20-25 as being directed to a non-elected invention and non-elected species. Applicant reserves the right to file a Divisional Application to pursue prosecution of non-elected claims 10-14 and 20-25.

The abstract was objected to for exceeding the 150 word limit. Applicant has amended the abstract so as not to exceed the 150 word limit. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the objection to the abstract.

Claims 1-9, 15-19, and 26 were provisionally rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 11-17 of co-pending U.S. Application No. 11/814,616.

Since the present application has an earlier filing date than U.S. Application No. 11/816,616, Applicant respectfully submits that the provisional rejection should be withdrawn and the application allowed to issue without a terminal disclaimer. See M.PE.P. § 804(I)(B)(1).

Accordingly, Applicant requests reconsideration and withdrawal of the provisional rejection of claims 1-9 and 19 under the judicially created doctrine of double patenting as being unpatentable over claims 11-17 of co-pending U.S. Application No. 11/814,616.

Claims 1 and 19 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Christen et al. (U.S. 2002/0025465). Claims 15 and 16 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being

unpatentable over Colbow et al. (U.S. 2003/0003336). Claims 2 and 5-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Christen et al. in view of Gopal et al. (U.S. 2004/0054483). Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Christen et al. and Gopal et al., and further in view of Ichikawa et al. (U.S. 2003/0180583). Claims 17 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Colbow et al. in view of Gopal et al. Claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Colbow et al. in view of Christen et al.

Applicant has canceled claims 1, 2, 15-18, and 26 and rewritten each of claims 3 and 4 to be in independent form and to include all of the features of claims 1 and 2.

Applicant respectfully traverses the rejections of claims 3-9 and 19.

Claim 3 has been amended to recite:

> A fuel cell system comprising:
> a fuel cell stack which is supplied with a fuel aqueous solution and generates electric energy by electro-chemical reaction;
> a concentration detector arranged to detect a concentration of the fuel aqueous solution to be supplied to the fuel cell stack;
> a temperature detector arranged to detect a temperature of the fuel cell stack;
> an input amount determining device arranged to determine an amount of fuel to be inputted to the fuel aqueous solution based on the concentration of the fuel aqueous solution detected by the concentration detector and the temperature of the fuel cell stack detected by the temperature detector; and
> an input device arranged to input the determined amount of the fuel to the fuel aqueous solution; wherein
> the input amount determining device includes:
> a memory arranged to store data which indicates a correspondence between the temperature of the cell stack and a target concentration of the fuel aqueous solution;
> a target concentration determining device arranged to determine a target concentration of the fuel aqueous solution by making reference to the data in the memory and based on the temperature of the fuel cell stack detected by the temperature detector; and
> an input fuel amount determining device arranged to determine an amount of fuel to be input based on the concentration of the fuel aqueous solution detected by the concentration detector and the target concentration determined by the target concentration determining device;

> the fuel cell system further comprises:
> **a target temperature raise time setting device arranged to set a target temperature raise time which indicates a time that is necessary for increasing the fuel cell stack to a predetermined temperature**; wherein
> **the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the target temperature raise time, and the target concentration**; and
> **the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the target temperature raise time set by the target temperature raise time setting device**. (emphasis added)

With respect to original claim 3, the Examiner acknowledged that neither of Christen et al. and Gopal et al. teaches a temperature raise time setting device, but alleged that Ichikawa et al. teaches a clock (claim 11) and a controller which estimates the energy required to activate the fuel cell "based on operating conditions at that time such as the temperature difference between the fuel cell stack and the atmosphere and the battery residual charge."

Applicant respectfully disagrees that Ichikawa et al. cures the deficiencies of Christen et al. and Gopal et al. for the following reasons.

The clock 57B of Ichikawa et al. stores operation time of a vehicle having the fuel cell mounted thereon in order to determine whether or not a trip by the vehicle will be a short trip, wherein the vehicle can run solely on the electric charge in a battery and the fuel cell does not need to be activated, or a long trip, wherein the fuel cell must be activated. See, for example, paragraph [0082] of Ichikawa et al. which teaches:

> For example, learning control can be used to store a date/time running pattern comprising any one of a calendar 57A, a clock 57B, a GPS 57C (see in FIG. 1) or a combination thereof. Thus it is possible to determine either short-term operation running mode or normal running mode according to the stored date/time running pattern. **The date/time running pattern is a running pattern specific to the driver determined on the date, day of the week or time period**. **For example, when the fuel cell vehicle is used for delivering goods, in a weekday time period, it is clearly the case that the vehicle will frequently operate in a short-term operation running mode due to performing deliveries to high-density housing areas**. In this case, learning

> control stores short-term operation running mode as the mode for the delivery time period. (emphasis added)

Thus, the clock 57B of Ichikawa et al. has absolutely nothing to do with setting a target temperature raise time which indicates a time that is necessary for increasing a temperature of the fuel cell to a predetermined temperature, and Ichikawa et al. certainly does not teach or suggest that the target concentration is determined by reference to the temperature of the fuel cell, the target temperature raise time, or a target concentration.

Thus, the combination of Christen et al., Gopal et al., and Ichikawa et al. clearly fails to teach or suggest the features of "a target temperature raise time setting device arranged to set a target temperature raise time which indicates a time that is necessary for increasing the fuel cell stack to a predetermined temperature," "the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the target temperature raise time, and the target concentration," and "the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the target temperature raise time set by the target temperature raise time setting device," as recited in Applicant's claim 3.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Christen et al. and Gopal et al., and further in view of Ichikawa et al.

Claim 4 has been amended to recite:

> A fuel cell system comprising:
> a fuel cell stack which is supplied with a fuel aqueous solution and generates electric energy by electro-chemical reaction;
> a concentration detector arranged to detect a concentration of the fuel aqueous solution to be supplied to the fuel cell stack;
> a temperature detector arranged to detect a temperature of the fuel cell stack;

an input amount determining device arranged to determine an amount of fuel to be inputted to the fuel aqueous solution based on the concentration of the fuel aqueous solution detected by the concentration detector and the temperature of the fuel cell stack detected by the temperature detector; and

an input device arranged to input the determined amount of the fuel to the fuel aqueous solution; wherein

the input amount determining device includes:

a memory arranged to store data which indicates a correspondence between the temperature of the cell stack and a target concentration of the fuel aqueous solution;

a target concentration determining device arranged to determine a target concentration of the fuel aqueous solution by making reference to the data in the memory and based on the temperature of the fuel cell stack detected by the temperature detector; and

an input fuel amount determining device arranged to determine an amount of fuel to be input based on the concentration of the fuel aqueous solution detected by the concentration detector and the target concentration determined by the target concentration determining device;

the fuel cell system further comprises:

a secondary battery electrically connected with the fuel cell stack, and an electric-charge detector arranged to detect an amount of electric charge in the secondary battery; wherein

the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the amount of electric charge in the secondary battery, and the target concentration; and

the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the amount of electric charge in the secondary battery detected by the electric-charge detector. (emphasis added)

With respect to original claim 4, the Examiner acknowledged that neither of Christen et al. and Gopal et al. teaches a secondary battery and detecting a charge of the secondary battery, but alleged that Ichikawa et al. teaches a sensor for detecting a charge of a secondary battery and a controller for estimating the energy required to activate the fuel cell "based on operating conditions at that time such as the temperature difference between the fuel cell stack and the atmosphere and the battery residual charge."

Applicant respectfully disagrees that Ichikawa et al. cures the deficiencies of Christen et al. and Gopal et al. for the following reasons.

Ichikawa et al. teaches detecting a charge in the secondary battery primarily to determine if the battery can supplement the energy provided by the fuel cell (see, for example, paragraph [0031] of Ichikawa et al.) and whether or not fuel cell should be activated so as not to unnecessarily consume electric power from the battery (see, for example, paragraphs [0037] and [0038] of Ichikawa et al.). Although Ichikawa et al. teaches that the energy required to activate the fuel is affected by temperature (see, for example, Fig. 3 of Ichikawa et al.), Ichikawa et al. does not remotely teach or suggest determining a target concentration of the fuel aqueous solution based on the temperature of the fuel cell or the amount of electric charge of the battery. In fact, Ichikawa et al. does not teach or suggest anything at all about the concentration, let alone the target concentration, of the aqueous fuel solution in the fuel cell.

Thus, the combination of Christen et al., Gopal et al., and Ichikawa et al. clearly fails to teach or suggest the features of "a secondary battery electrically connected with the fuel cell stack, and an electric-charge detector arranged to detect an amount of electric charge in the secondary battery," "the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the amount of electric charge in the secondary battery, and the target concentration," and "the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the amount of electric charge in the secondary battery detected by the electric-charge detector," as recited in Applicant's claim 4.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Christen et al. and Gopal et al., and further in view of Ichikawa et al.

The Examiner relied upon Colbow et al. to allegedly cure deficiencies of Christen et al., Gopal et al., and Ichikawa et al. However, Colbow et al. clearly fails to teach or

suggest the features of "a target temperature raise time setting device arranged to set a target temperature raise time which indicates a time that is necessary for increasing the fuel cell stack to a predetermined temperature," "the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the target temperature raise time, and the target concentration," and "the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the target temperature raise time set by the target temperature raise time setting device," as recited in Applicant's claim 3, or the features of "a secondary battery electrically connected with the fuel cell stack, and an electric-charge detector arranged to detect an amount of electric charge in the secondary battery," "the data in the memory includes data which indicates a correspondence between the temperature of the fuel cell stack, the amount of electric charge in the secondary battery, and the target concentration," and "the target concentration determining device determines the target concentration of the fuel aqueous solution by making reference to the data and based on the temperature of the fuel cell stack detected by the temperature detector and the amount of electric charge in the secondary battery detected by the electric-charge detector," as recited in Applicant's claim 4. Thus, Applicant respectfully submits that Colbow et al. fails to cure the deficiencies of Christen et al., Gopal et al., and Ichikawa et al. described above.

Accordingly, Applicant respectfully submits that Christen et al., Gopal et al., Ichikawa et al., and Colbow et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicant's claims 3 and 4.

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 3 and 4 are allowable. Claims 5-9, 19, and 27-32 depend upon claims 3 and 4, and are therefore allowable for at least the reasons that claims 3 and 4 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt

allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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